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DATA SHEET

74F808, 74F1808
Hex 2-input AND drivers

Product specification

1991 Jan 02

IC15 Data Handbook

Philips
Semiconductors

PHILIPS

FEATURES

- High capacitive drive capability
- Choice of configuration
  Corner V_{CC} and GND – 74F808
  Center V_{CC} and GND – 74F1808
- Typical propagation delay of 4.0ns
- Superior ground noise characteristics (implemented using output edge rate control)
- Increased source and sink current (64mA)

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F808	4.0ns	24mA
74F1808	4.0ns	24mA

ORDERING INFORMATION

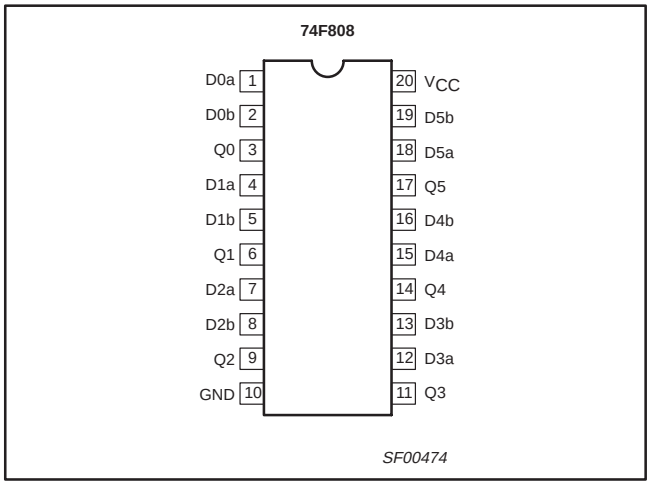
DESCRIPTION	ORDER CODE	PKG DWG #
	COMMERCIAL RANGE V_{CC} = 5V ±10%, T_{amb} = 0°C to +70°C	
20–pin plastic DIP	N74F808N, N74F1808N	SOT 146-1
20–pin plastic SOL	N74F808D, N74F1808D	SOT163-1

INPUT AND OUTPUT LOADING AND FAN OUT TABLE

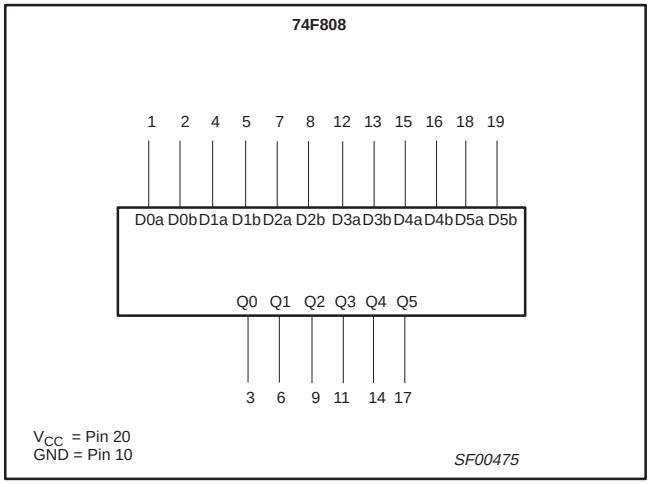
PINS	DESCRIPTION	74F (U.L.) HIGH/ LOW	LOAD VALUE HIGH/LOW
Dna – Dnb	Data inputs	1.0/0.033	20µA/20µA
Q0 – Q5	Data outputs	3200/106.	64mA/64mA

NOTE: One (1.0) FAST unit load is defined as: 20µA in the high state and 0.6mA in the low state.

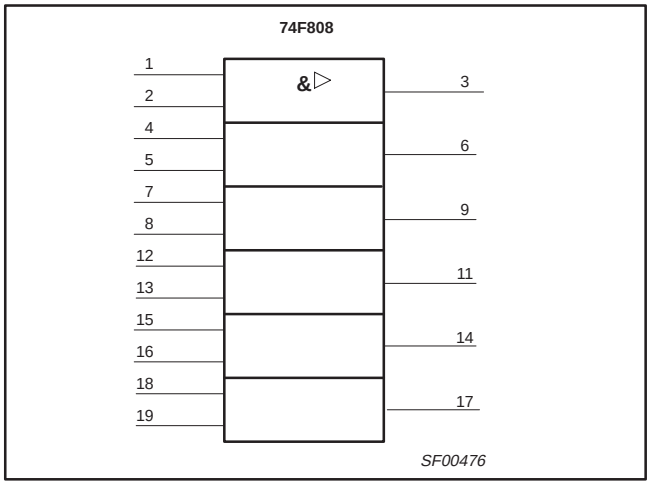
PIN CONFIGURATION



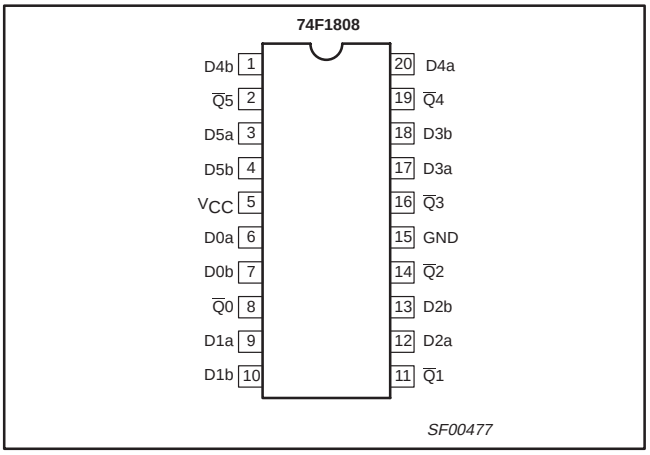
LOGIC SYMBOL



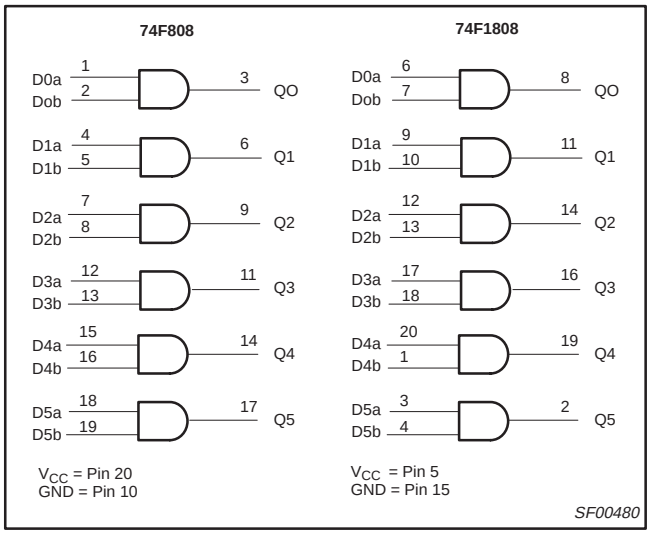
IEC/IEEE SYMBOL



PIN CONFIGURATION



LOGIC DIAGRAM



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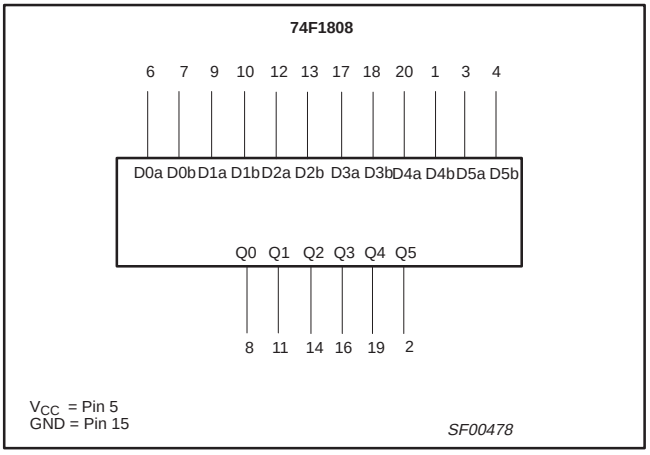


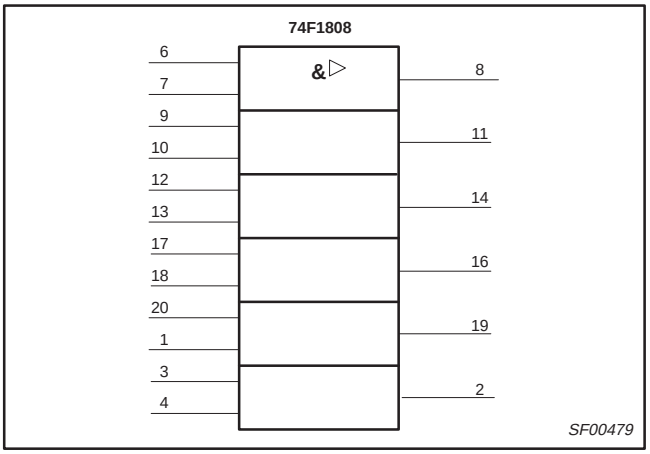
FUNCTION TABLE

INPUTS		OUTPUT
Da	**Db**	**Q**
H	H	H
L	X	L
X	L	L

NOTES:

H = High voltage level
L = Low voltage level
X = Don't care

IEC/IEEE SYMBOL



ABSOLUTE MAXIMUM RATINGS

(Operation beyond the limit set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	–0.5 to +7.0	V
V_{IN}	Input voltage	–0.5 to +7.0	V
I_{IN}	Input current	–30 to +5	mA
V_{OUT}	Voltage applied to output in high output state	–0.5 to V_{CC}	V
I_{OUT}	Current applied to output in low output state	96	mA
T_{amb}	Operating free air temperature range	0 to +70	°C
T_{stg}	Storage temperature range	–65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			T_A = –40 to +85°C
UNIT		MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5.0	5.5	V
V_{IH}	High–level input voltage	2.0			V
V_{IL}	Low–level input voltage			0.8	V
I_{Ik}	Input clamp current			–18	mA
I_{OH}	High–level output current			–64	mA
I_{OL}	Low–level output current			64	mA
T_{amb}	Operating free air temperature range	0		+70	°C

DC ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER		TEST CONDITIONS[1]		LIMITS			UNIT
					MIN	TYP[2]	MAX	
V_{OH}	High-level output voltage		V_{CC} = MIN, V_{IL} = MAX	±10%V_{CC}	2.0			V
			V_{IH} = MIN, I_{OH} = MAX	±5%V_{CC}	2.0			V
V_{OL}	Low-level output voltage		V_{CC} = MIN, V_{IL} = MAX	±10%V_{CC}		0.38	0.55	V
			V_{IH} = MIN, I_{OL} = MAX	±5%V_{CC}		0.38	0.55	V
V_{IK}	Input clamp voltage		V_{CC} = MIN, I_I = I_{IK}			-0.73	-1.2	V
I_I	Input current at maximum input voltage		V_{CC} = MAX, V_I = 7.0V				100	µA
I_{IH}	High–level input current		V_{CC} = MAX, V_I = 2.7V				20	µA
I_{IL}	Low–level input current		V_{CC} = MAX, V_I = 0.5V				-20	µA
I_O	Output current[3]		V_{CC} = MAX		-60		-180	mA
I_{CC}	Supply current (total)	I_{CCH}	V_{CC} = MAX	V_{IN} = GND		19	27	mA
		I_{CCL}		V_{IN} = 4.5V		30	42	mA

NOTES:

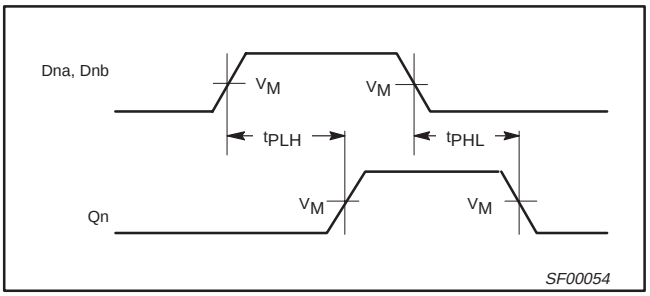
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_{amb} = 25°C.
3. The output conditions have been chosen to produce a current that closely approximates one half of the true short–circuit output current, I_{OS}.

AC ELECTRICAL CHARACTERISTICS

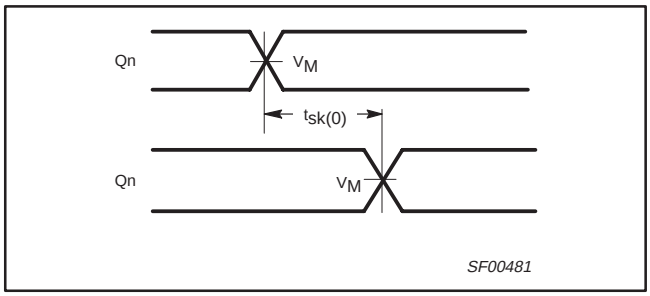
SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			T_{amb} = +25°C V_{CC} = +5.0V C_L = 50pF, R_L = 500Ω			T_{amb} = 0°C to +70°C V_{CC} = +5.0V ± 10% C_L = 50pF, R_L = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay Dna, Dnb to Qn	Waveform 1	2.0 2.0	4.5 3.5	6.3 6.0	2.0 1.5	6.8 6.5	ns
$t_{sk(o)}$	Output skew[1,2]	Waveform 2			2.5		3.0	ns

NOTES:
1. [t_{PN} actual – t_{PM} actual] for any output compared to any other output where N and M are either LH or HL.
2. Skew times are valid only under same test conditions (temperature, V_{CC}, loading, etc.,).

AC WAVEFORMS



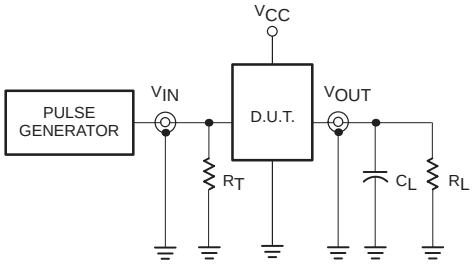
Waveform 1. Propagation delay for inverting outputs



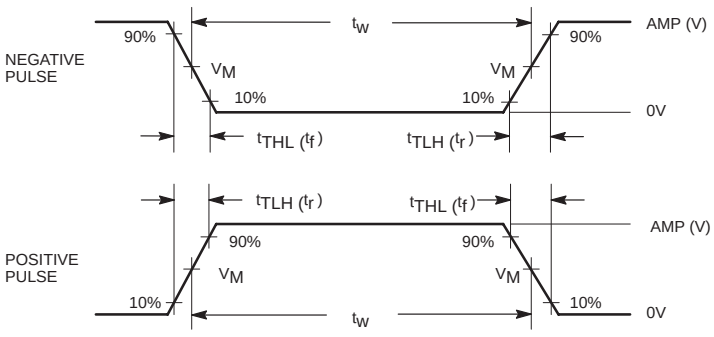
Waveform 2. Output skew

NOTE: For all waveforms, V_M = 1.5V.

TEST CIRCUIT AND WAVEFORMS



Test Circuit for Totem-Pole Outputs



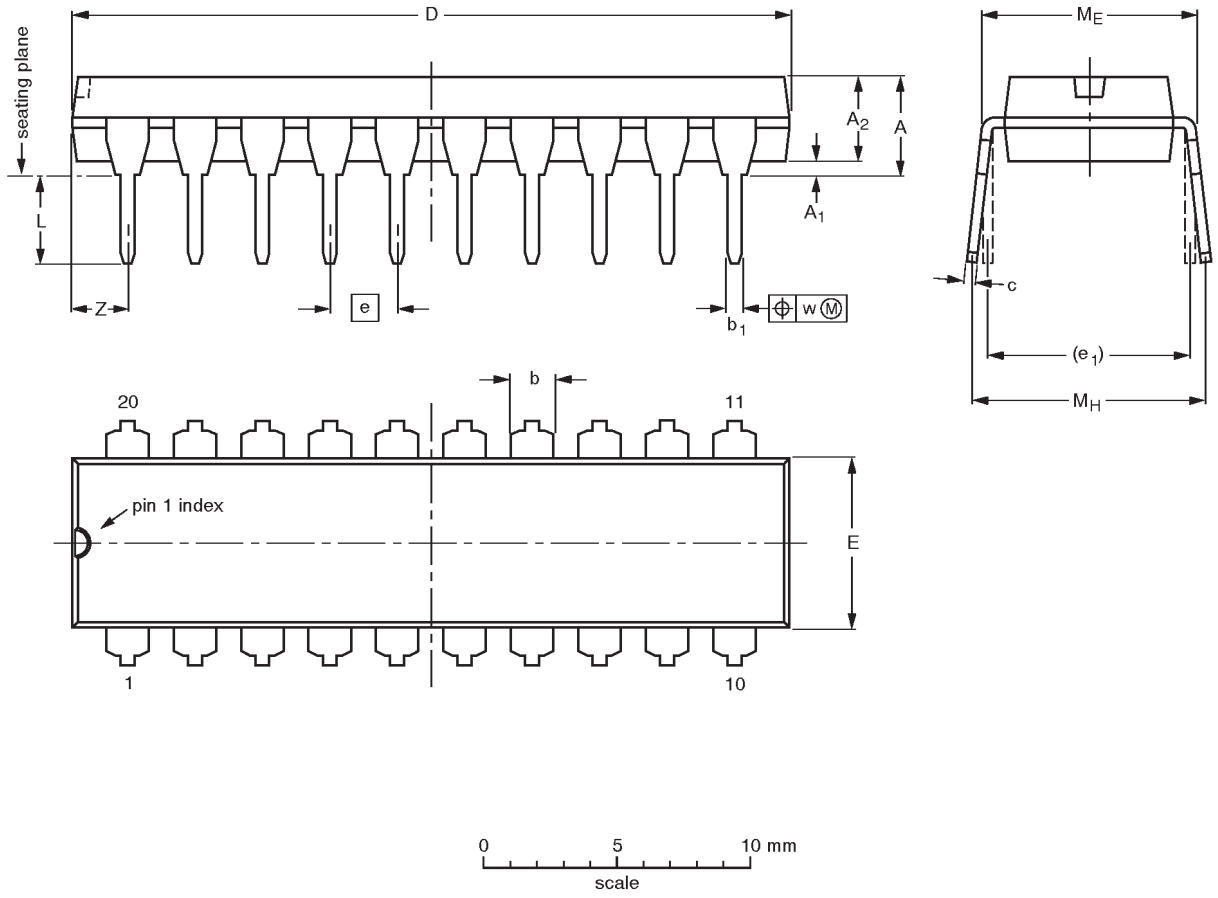
Input Pulse Definition

family	INPUT PULSE REQUIREMENTS					
	amplitude	V_M	rep. rate	t_w	t_{TLH}	t_{THL}
74F	3.0V	1.5V	1MHz	500ns	2.5ns	2.5ns

DEFINITIONS:
R_L = Load resistor; see AC ELECTRICAL CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC ELECTRICAL CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

SF00006

DIP20: plastic dual in-line package; 20 leads (300 mil) **SOT146-1**



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

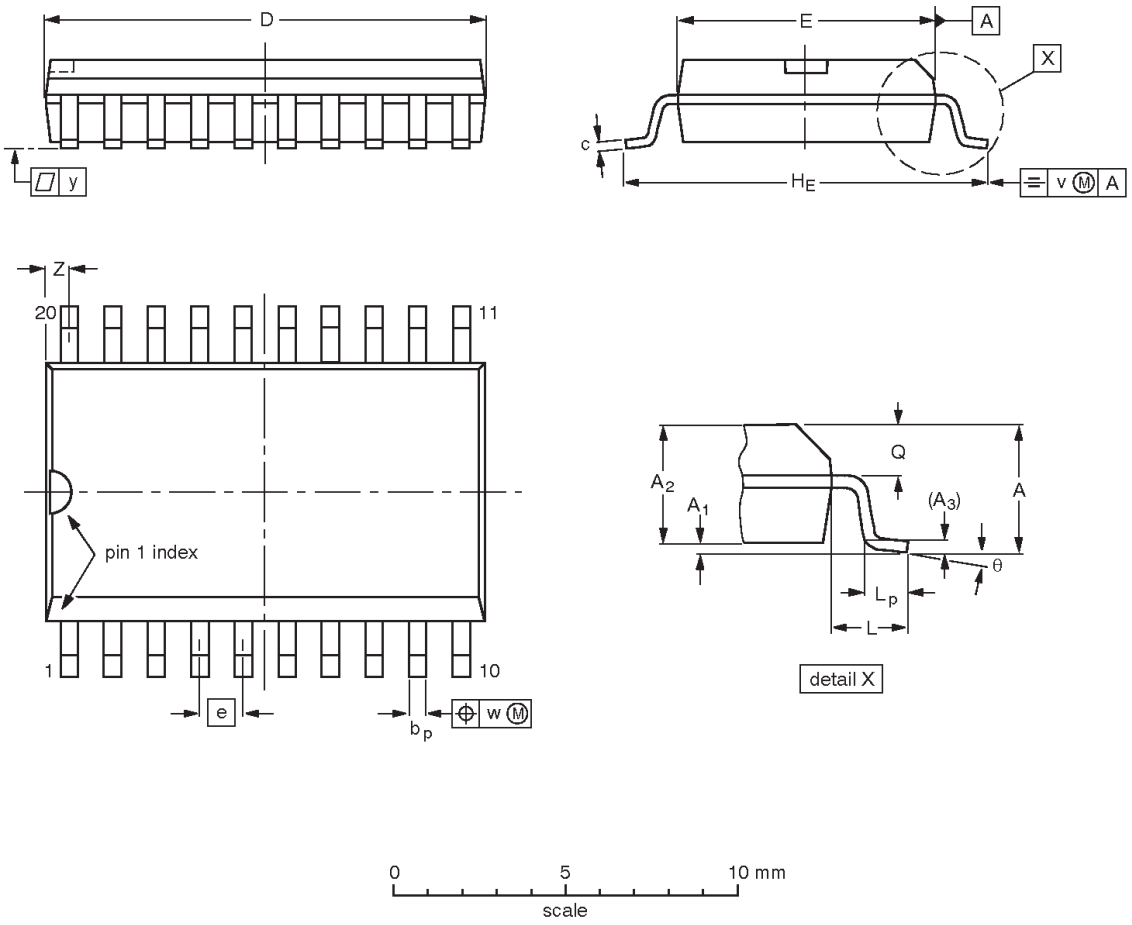
UNIT	A max.	A_1 min.	A_2 max.	b	b_1	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	0.36 0.23	26.92 26.54	6.40 6.22	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	2.0
inches	0.17	0.020	0.13	0.068 0.051	0.021 0.015	0.014 0.009	1.060 1.045	0.25 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.078

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT146-1			SC603			~~92-11-17~~ 95-05-24

SO20: plastic small outline package; 20 leads; body width 7.5 mm **SOT163-1**



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8^o 0^o
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.050	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT163-1	075E04	MS-013AC				~~95-01-24~~ 97-05-22

Data sheet status

Data sheet status	Product status	Definition [1]
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make chages at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

[1] Please consult the most recently issued datasheet before initiating or completing a design.

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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